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Description

METHOD AND SYSTEM FOR SHIPPING/MAILING

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Technical Field

The invention relates to shipping/mailing techniques, more particularly utilizing distributive
5 computerized technology.

Background of the Invention

Many offices/organizations process large numbers of mail pieces or parcels and utilize different shipping or mailing carriers such as the United States
10 Postal Service (USPS), United Parcel Service (UPS), Federal Express (FedEx), RPS and DHL, for example. For each mail piece, the carriers require shipping/mailing information including the delivery address and, typically, further instructions such as the class of
15 service, for example.

The required information may be supplied by manual entry, e.g. using the carrier's proprietary software. Such entry tends to be inefficient and error
20 prone.

Summary of the Invention

The present invention aims at more efficient and error-free processing of shipping/mailing information. Measures are taken for reducing manual work
25 and validating the information, including utilization of optical scanning, character recognition (OCR) and bar codes, and reference to standard address databases in a distributive-processing technique, e.g. client-server or peer-to-peer.

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In addition to the addressee, a user of the technique may specify the carrier and/or a class of service to be used for delivery. Alternatively, choice of a delivery option can be provided automatically, based on predefined rules. At a user site, delivery information may be entered by typing, by importing from a personal or public database/list, or by scanning by an optical character recognizer (OCR), for example.

An entered delivery address can be checked against the USPS Address Matching System (AMS) database to verify its validity. If the address fails to check out, possible valid addresses can be offered automatically for the user's consideration. Automatically also, addresses can be standardized, e.g. as to font and format, and for readability. Additional data may be appended, e.g. an internal billing code and/or a tracking ID.

Shipping/mailing data as provided or generated can be printed onto a label or other suitable medium, readable to a human and/or in an encoded form, e.g. a 2-dimensional bar code as based on a 2-D symbol standard such as PDF-417 or Data Matrix, for example. With the label affixed, e.g. detachably, a parcel or mail piece is ready for forwarding to a shipping/mailing room/location.

Preferably, with the label including a bar code, shipping/mailing information can be scanned for automated processing at the shipping location, to print the selected shipper's actual shipping label and postage if required. To facilitate tracking, the shipping/mailing information may be uploaded to the shipper, e.g. to UPS Online.

Brief Description of the Drawing

Fig. 1 is a diagram illustrating mail piece origination.

Fig. 15 is a state diagram for automated seat
30 feature enforcement.

Features as described herein with reference to the drawing have been implemented in an exemplary system here designated as Addressing and Bar Code (ABC)

Link/Host. The features are not required all to be included in a single embodiment of the invention, but can be used individually or in any suitable combination within various preferred embodiments. Conveniently in
5 implementation, a suitable programming language is used, e.g. C++.

Figs. 1 and 2 illustrate over-all processing in shipping/mailing, e.g. at a large office facility. Specifically, Fig. 1 illustrates origination or
10 generation of mail pieces at an enterprise network 100, and Fig. 2 their processing at a shipping/mailing center 103 where the mail pieces are further processed to shipping carriers such as the Post Office, UPS, RPS, FedEx and DHL, for example.

15 Fig. 1 shows a label 105 comprising a bar code 110, generated at a enterprise network site 100 for processing a mail piece 115. A user at a terminal 101 of the site 100 enters shipping information for the mail piece 115, such as shipping destination, originator
20 identification, carrier, shipping class and declared value of the contents. The shipping information is encrypted and included in the bar code 110 on the label 105. The bar code 110 may be based on the PDF-417, Data Matrix, or other 2D-symbol standard. The label 105,
25 which includes the entered shipping information and the bar code 110, is printed on a network or local printer of the site 100, and placed on the mail piece 115 for forwarding to the center 103 of Fig. 2 for shipping/mailing.

30 Fig. 2 shows the bar code 110 for the mail piece 115 being read using a bar code scanner 120 connected to a terminal 125 at the shipping/mailing center. The terminal 125 has suitable bar code recognition and decryption software for extraction and
35 decryption of the shipping information from the bar code

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110. The terminal 125 converts the shipping information into the appropriate format of the carrier selected for the mail piece 115. The converted information is uploaded to the shipping software of the selected carrier, e.g. UPS Online, and the terminal 125 instructs a thermal printer 130 to print a shipping label 135 for use by the carrier. With the shipping label 135 affixed, the mail piece 115 is ready for processing by the selected carrier.

Fig. 3 shows a graphical user interface (GUI) or screen display for processing at the terminal 101, with shipping by the USPS being shown as an example. The display resembles typical text processor screens, including a row 151 of menu buttons, a row 152 of icons, a shipping class display 153 as selected by one of the click tabs 154, here for the USPS, an address text display 155, a special services selection display 156, an originating department information display 157, a multiple-label button 158, a print button 159, an address book access button 160, a "remove" button 161 and a shipping directions button 162. Functions are actuated and controlled by typing, and by familiar clicking on buttons, tabs and icons.

It has been recognized that the use of conventional bar codes for the labels generated at network 100 for processing at a shipping/mailing center 103 may be susceptible to fraudulent circumvention. For example, a conventional bar code on label 105 might be readable by an unauthorized, conventional bar code reader. The use of unauthorized systems and components may undermine the integrity and performance of the shipping process.

As a countermeasure, the shipping information for the mail piece 115 is encrypted before it is used to generate the bar code 110. The terminal 125 includes a

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decryption algorithm for the data read by the bar code reader 120 from the bar code 110. Unauthorized systems, without the decryption algorithm will be unable to process the encrypted shipping information from the bar code 110.

Further to deter the use of unauthorized equipment at shipping/mailling room center 103, the shipping address and information for a mail piece can be shuffled in accordance with a predetermined shuffling algorithm prior to encryption. For example, the order of first and last names of a recipient may be reversed prior to encryption. At the mailroom terminal 125, a rearrangement algorithm will then undo the shuffling. Shuffling and rearrangement algorithms can be updated periodically to prevent their discovery upon inspection of the shuffled shipping information.

While use of the scanner 120 eliminates the likelihood for error in transferring the shipping information onto the shipping label 135, without further validation there remains a concern with error at the source, e.g. a user at the terminal 101 entering erroneous shipping information. A resulting invalid shipping address may remain undetected until the carrier fails to deliver the mail piece 115. This concern can be minimized by measures as follows:

Fig. 4 shows a user network 100 for use with Windows NT, featuring address validation using a database provided by the USPS, with validation being facilitated by standardizing addresses as to their format. The USPS address database service, known as its Address Matching System (AMS), includes on a CD-ROM all valid U.S. addresses in a standardized format. Updated versions are provided periodically under a license agreement.

The network 100 comprises a network server 200 and a network hub 205, providing network services to

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client terminals 210, 215, 220, and 225. The network 100 may be a packet-switched network for transporting information in accordance with the standard transmission control protocol/internet protocol (TCP/IP). Remote
5 access is provided for terminal 225 by a dial-up/Internet connection through the modem 230.

Windows operating systems, e.g. Windows 95, 98 or NT are installed at the server 200 and terminals 210, 215, 220 and 225 for communicating amongst one another.
10 Further installed at the terminals 215, 220 and 225 is software here designated as ABC Link and, at the terminal 210, software designated as ABC Host. The latter includes an AMS capability for making use of the AMS CD in a CD-ROM drive 235. A hardware key 240 is connected
15 at a communication port of the terminal 210, representing a contractual safeguarding element.

For the host terminal 210, use of Windows NT is advantageous in that it provides a launch service that keeps ABC Host running even in the absence of any current
20 demand for shipping/mailing address processing. Thus, there will be no need for start-up when demand arises. For operating systems that do not provide such a service, e.g. Windows 95 and 98, a launcher application can be provided in the host terminal 210 for the same purpose.
25 The launcher application can be included automatically at the time ABC Host is installed at the terminal 210.

Installation and other auxiliary software for Link/Host can be stored at the network server 200 or any of the client terminals 210, 215, 220, or 225. Instead
30 of at one of the terminals, such as the terminal 210, ABC Host can be installed at the server 200. Conversely, while Fig. 4 shows a client-server configuration, ABC Link/Host can be implemented in the absence of the network server 200, in a peer-to-peer configuration.

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One and the same terminal may include ABC Host as well as ABC Link, e.g. the remote client terminal 225 in Fig. 4, with a corresponding additional subscription to ABC Host. In this case, the ABC Link at the terminal 5 225 may use either its own ABC Host or the one provided via the network

Fig. 5 illustrates shipping/mailing address validation/standardization in ABC Link/Host prior to use in labeling. Shown are two network client terminals 215 and 220, and three Internet client terminals 225-227, all in communication with the host terminal 210. From one of the client terminals, 215, potentially inaccurate or "dirty" shipping/mailing addresses are assembled in a marshaling list 500 for checking against AMS data 510 10 from the CD ROM 235. The host 210 returns proposed "clean" addresses to the marshaling list 500 for accessing from the client 215. 15

Without precluding processing of a single shipping/mailing address individually, the marshaling 20 list 500 facilitates processing of addresses in batches. This feature can serve to minimize the number of round-trip communications between the client terminal 215 and the host 210, thereby enhancing processing efficiency.

Fig. 6 illustrates address standardization 25 processing, either to the successful display of an address or to failure. From a client terminal 215, a pre-existing address 601 or a newly entered address 602 can be entered into a marshaling list 603 for submission 605 to the standardizing functionality 606 of the host 30 210. Submission also activates preparation of a license interface 604. Standardization 606 is contingent on verifications 607 and 608 that the hardware key 240 remains connected at the host 210 and the requirements of the license interface are met. If so, the submitted 35 address list is un-marshaled, 609, the submitted

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addresses are copied, 610, for AMS processing 611, a custom-address-marshaling list is prepared for the standardized addresses and is attached to the submitted address list, 612 and 613. The resulting list is un-marshaled, 614, for display.

Fig. 7 illustrates address data flow to printing. Addresses can be created or selected at a module 701, assembled as Array_Addresses 702, copied as Array_AddressSearch 703, AMS-processed, 704, e.g. as shown in Fig. 6, and copied as Array_AddressCorrected 705. As AMS-processing may result in several proposed corrected addresses for one and the same original new address, display at 706 will prompt the user to select the one intended, resulting in Array_AddressSelected 707 and a key index with respect to Array_AddressCorrected 705. Copying of the finally selected addresses yields Array_AddressChosen 708 to which business rules can be applied, e.g. generation of multiples to yield Array_AddressPrint. Final printing can be subject to printing rules, e.g. how many addresses to print per sheet of paper in generating labels.

Fig. 8 illustrates address processing for generating a label. An address 801 can be obtained from the clipboard 802 where it was placed by a different application 803. An address from the clipboard data can be parsed, 804, with different parsing rules 805-809 being applied depending on the number of lines of the address and on the presence/absence of numerals and special characters, for example. An address 801 can be saved in a database 810, preferably after ABC Host services 811 have produced the address as standardized, 812. A preferred carrier and class of service, 813, can be selected for an address 801 or standardized address 812. Printing, 814, can include a 2-dimensional bar code meeting the PDT417 standard, for example.

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Fig. 9 illustrates importing of addresses, activated from a menu 901 and involving browsing, e.g. of a text file 902, MVP import 903 or database 904. Options 905 include standardizing 906, creating a category 907 and including in a database 908. A standarzed address 906 can be selected, 910, for inclusion in the category 907.

Fig. 10 shows workstations 215, 220 and 225 with respective licenses 216, 221 and 226. System communications 1001 result in license registration at the server application 1002 which includes a license callback capability for periodic checking on workstations 215, 220 and 225 as to their status under the license. The server application 1002 can check licenses for functionality 1003, and the license can be destroyed, 1004, in case of lack of authorization. The license is destroyed also in case a license callback results in failure, in which case the number of available seats or licenses can be incremented, 1005, at a dynamic license table 1006. A time license rotator 1007 is in communication with the dynamic license table 1005, the server application 1002 and the license callback 1002.

Fig. 11 shows the host 210 starting the clock 1101 for periodically changing the license key 1102. Each time a new license key is chosen, the most recent two keys are saved in a history 1003. Issuance of a new key initiates callback at the callback queuing table 1104 that is informed by the total number of seats 1105 that is also referred to by the host 210 in ending an application if service is requested at too many terminals as compared with the number of licenses. The host 210 further refers to the authorization number 1106 and hardware dongle 1107, which both depend on seat options 1008. The ABC license 1009 is established when the application starts. Before an address standardization

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1010 can be effected, the key comparison 1011 has to be successful.

Fig. 12 illustrates feature or functionality authorization at the host 210 for a client 215 whose serial number is obtained from a dongle 1201. An authorization code is read, 1202. An encryption engine 1203 is called on for feature decryption, yielding options 1204. The options 1204 are concatenated with internal data 1205 and encrypted to form an encrypted electronic authorization signature 1206. Authorization is established if, at 1207, the authorization code and the encrypted electronic authorization signature are in agreement.

Fig. 13 illustrates processing of a request for address validation and standardization from a terminal 215. Passed in with a standardization request 1301 are a new address list 1302 and the ABC license interface 1303. The ABC host 210 promotes the base interface to the ABC license interface 1304 and ascertains that the request comes with a current authentication "cookie", or at least by one of the most recent two previous cookies. If so, the request for standardizing is acted on, 1306, by actuating AMS 235.

Fig. 14 illustrates license registration for ensuring that the number of client terminals using the system remains limited at all times by the number of licenses. At the terminal 215, the ABC license 1401 is created. Upon connection to the host 210, the license is registered, and a comparison 211 between the total number 212 of seats and the available or free number 213 of seats. If no seats are available, 214, the requesting application at the terminal 215 ends. If a seat is available, 215, from callback update table 216 the number of available seats 217 is decremented and a cookie 218 is

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issued for later, periodic verification that the terminal 215 continues to be in an authorized state.

Fig. 15 illustrates continuing seat feature enforcement. Periodically, e.g. every 2 minutes per
5 timer 1501, a new cookie is generated. The current cookie 1502 is saved, as are the two immediately preceding values, establishing a cookie history 1503. Where the callback table 1504 is updated successfully, the new cookie is forwarded to the corresponding active
10 terminal; otherwise, 1505, the corresponding license is canceled and the number of available seats is incremented, 1506.

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